IN THE CLAIMS:

1. (Currently amended) A system for determining a level of a substance, the system comprising:

a first conductive element ~~conveying a first electromagnetic signal~~ and a second conductive element ~~in proximity to a plurality of substances;~~ and so disposed with respect to each other that, when the first and second conductive elements extend through a boundary between a plurality of substances whose dielectric constants differ, the first electromagnetic signal will induce a second electromagnetic signal to propagate along the second conductive element;

~~a coupler positioned at a dielectric mismatch boundary between the substances, the coupler causing a change in a capacitance of the first conductive element upon the first electromagnetic signal traversing a part of the first conductive element substantially adjacent to the coupler;~~

~~a second conductive element conveying a second electromagnetic signal based on the first electromagnetic signal and being coupled thereto by the change in capacitance of the first conductive element caused by the coupler;~~

a transmitter operable to drive a first electromagnetic signal along the first conductive element without also driving the second conductive element;

a receiver operable to receive the second electromagnetic signal; and

a processor operable to execute[[ing]] instructions to determine, ~~a level of at least one of the substances based~~ at least in part ~~on~~ from a ~~the~~ time delay between the first and second electromagnetic signals, a level of at least one of the substances.

2. (Currently amended) The system of claim 1 wherein the first and second conductive elements are positioned substantially parallel to each other and substantially perpendicular to the ~~dielectric mismatch~~ boundary between the substances.

3. (Previously presented) The system of claim 1 wherein the first electromagnetic signal exhibits an ultra-wideband frequency.

4. (Currently amended) The system of claim 1 wherein the ~~dielectric mismatch~~ boundary between the substances corresponds to a transitional region between a gaseous substance and a liquid substance.

5. (Currently amended) The system of claim 1 wherein the ~~dielectric mismatch~~ boundary between the substances corresponds to a transitional region between at least two of a vacuum, a gaseous substance, a liquid substance, a semi-solid substance, and a solid substance.

6 (Cancelled) The system of claim 1 further comprising a transmitter for forming the first electromagnetic signal.

7. (Currently amended) The system of claim 1 wherein ~~further comprising a~~ the receiver is further operable to detect ~~for detecting~~ the time delay between the first and second electromagnetic signals

8. (Previously presented) The system of claim 7 wherein the receiver includes an equivalent time sampling circuit.

9. (Previously presented) The system of claim 1 wherein the first and second conductive elements form a parallel conductor transmission line structure.

10. (Previously presented) The system of claim 1 wherein the first and second conductive elements are flexible.

11. (Previously presented) The system of claim 1 wherein the first and second conductive elements exhibit quadrilateral cross-sections.

12. (Previously presented) The system of claim 1 wherein the first and second conductive elements exhibit substantially identical cross-sections.

13. (Currently amended) The system of claim 1 wherein an amplitude of the second electromagnetic signal is substantially independent of dielectric properties associated with the substances forming the ~~dielectric mismatch~~ boundary.

14. (Previously presented) The system of claim 1 wherein the coupler exhibits a length corresponding to at least one-quarter of a propagation velocity pulse length of the first electromagnetic signal.

15. (Currently amended) The system of claim 1 further comprising:

a float for positioning the coupler at the ~~dielectric mismatch~~ boundary between the substances.

16. (Previously presented) The system of claim 15 wherein the float includes a buoyant component and a weighted component.

17. (Previously presented) The system of claim 1 wherein the level corresponds to a volume of fluid in an above-ground storage tank.

18. (Previously presented) The system of claim 1 wherein the level corresponds to a volume of fluid in a below-ground storage tank.

19. (Previously presented) The system of claim 1 wherein the processor communicates the substance level to a digital data processing device during a communication session.

20. (Currently amended) A method of determining a level of a substance, the method comprising:

driving ~~transmitting~~ a first electromagnetic signal along ~~on~~ a first conductive element without also driving a second conductive element, the first conductive element and the second conductive element ~~being in proximity to a plurality of substances;~~ and so disposed with respect to each other that, when the first and second conductive elements extend through a boundary between a plurality of substances whose dielectric constants differ, the first electromagnetic signal will induce a second electromagnetic signal to propagate along the second conductive element;

~~providing a coupler positioned at a dielectric mismatch boundary between the substances, the coupler causing a change in a capacitance of the first conductive element~~

~~upon the first electromagnetic signal traversing a part of the first conductive element substantially adjacent to the coupler;~~

receiving the ~~a~~ second electromagnetic signal ~~based on the first electromagnetic signal at a second conductive element and in response the change in capacitance of the first conductive element caused by the coupler~~; and

determining, ~~a level of at least one of the substances based~~ at least in part from ~~on~~ a time delay between the first and second electromagnetic signals, a level of at least one of the substances.

21. (Previously presented) The method of claim 20 wherein the first and second conductive elements are flexible.

22. (Currently amended) The method of claim 20 wherein the first and second conductive elements are positioned substantially parallel to each other and substantially perpendicular to the ~~dielectric mismatch~~ boundary between the substances.

23. (Currently amended) The method of claim 20 wherein an amplitude of the second electromagnetic signal is independent of dielectric properties associated with the substances forming the ~~dielectric mismatch~~ boundary.

24. (Currently amended) The method of claim 28 [[20]] further comprising:

providing a float for positioning the coupler relative to the ~~dielectric mismatch~~ boundary between the substances.

25. (New) The system according to claim 1 further comprising:

a coupler for so coupling the first and second conductive elements as to launch the second electromagnetic signal along the second conductive element when the first electromagnetic signal reaches the position of the coupler.

26. (New) The system according to claim 25 wherein the coupler is positioned at the boundary between the substances.

27. (New) The system according to claim 1 wherein the transmitter drives a first electromagnetic signal from a first end of a first conductive element toward a second end of the first conductive element, without also driving a second conductive element,

and wherein an induced second electromagnetic signal will propagate along the second conductive element toward a first end of the second conductive element.

28. (New) The method according to claim 20 further comprising:

coupling, with a coupler, the first and second conductive elements as to launch the second electromagnetic signal along the second conductive element when the first electromagnetic signal reaches the position of the coupler.

29. (New) The method according to claim 28 wherein the coupler is positioned at the boundary between the substances.

30. (New) The method according to claim 20, wherein driving comprises driving a first electromagnetic signal from a first end of a first conductive element toward a second end of the first conductive element without also driving a second conductive element, the first conductive element being in proximity to a plurality of substances,

and wherein an induced second electromagnetic signal will propagate along the second conductive element toward a first end of the second conductive element.

31. (New) A system for determining a level of a substance comprising:

a first conductive element and a second conductive element, wherein the first conductive element and the second conductive element are in proximity to a plurality of substances;

a transmitter operable to drive a first electromagnetic signal along the first conductive element without also driving the second conductive element;

a coupler positioned at a dielectric mismatch boundary between the substances for so coupling the first and second conductive elements as to launch a second electromagnetic signal along the second conductive element when the first electromagnetic signal reaches the position of the coupler;

a receiver operable to receive the second electromagnetic signal; and

a processor operable to determine, at least in part from a time delay between the first and second electromagnetic signals, a level of at least one of the substances.